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ABSTRACT

An evaluation of Monetary Economics, a course offered to distance education students of the University of Queensland in 1979 and 1980, was conducted in 1981. Monetary Economics is an innovative course designed and prepared using principles of educational technology specifically for distance education, and for the planning of effective interaction between the subject, teacher, and students. The aims of the course were to enable students to learn at their own individual pace and to increase the level of activity and involvement in the learning process. Audiotapes, workbooks, and small group syndicate discussions were used to achieve these aims. This report begins by describing the design strategy and major course features, including theoretical considerations, subject area considerations, student characteristics, design principles, and course structure. This description is followed by an explanation of the evaluation procedures and the results of the evaluation, which focused on student performance and their assessment of the course, course efficiency, cost effectiveness, and the consistency of results. It is concluded that the effectiveness of Monetary Economics is directly attributable to the effectiveness of education technology, which employed sound principles of learning to solve a problem in course design. A copy of the student questionnaire is appended. (30 references) (DB)

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Working Papers in DISTANCE EDUCATION

EVALUATION OF A THIRD YEAR DISTANCE
EDUCATION COURSE: MONETARY ECONOMICS

J.D. Stanford and B.W. Imrie

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AUSTRALIA.

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No. 1

J.D. STANFORD AND B.W. IMRIE, "Evaluation of a Third Year
Distance Education Course: Monetary Economics".

(An abridged version of this paper is to appear in The British
Journal of Educational Technology.)

EVALUATION OF A THIRD YEAR DISTANCE

EDUCATION COURSE: *MONETARY ECONOMICS*

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** Some work was carried out while this author was on sabbatical leave at Tertiary Education Institute, University of Queensland.

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1. Introduction

This paper reports the results of an evaluation of Monetary Economics, a course offered to external or distance students of the University of Queensland in 1979 and 1980. The University of Queensland has been involved in distance education since its establishment in 1911. This distance education programme which enables off campus students to complete the standard undergraduate degrees of the University of Queensland has a 1980 enrolment of over 3000 students in the Faculties of Arts, Law, Commerce and Economics and Education; this represents about 15 per cent of all enrolled students but about 9 per cent of equivalent full time students. Monetary Economics is a ten credit point course (240 credit points are required for the award of a degree) and is available as a level three (third year undergraduate) course.

Although the University of Queensland has a strong commitment to distance education, most courses available to off campus students are conducted in the traditional correspondence style. Monetary Economics, in this context, is an innovative course which has been designed and prepared using principles of educational technology specifically for distance education (Stanford, 1979) and which used technology in education to assist student learning.

The design of the course took the view that, while the choice of content for the course was an academically important matter, there was a further responsibility which required the employment of the principles of educational technology to plan for the effective interactions between the subject, the teacher and the student (Hyman, 1970).

When the course is provided for external or distance students and there are no scheduled class meetings for student-teacher contact, it is

necessary for the teacher to provide other means to develop the interaction between the student and the subject. In addition to complementing content selection, the course materials prepared by the teacher should incorporate structure and guidelines to facilitate individual student learning.

Learning is the student's responsibility; it is the teacher's role to bring about a 'coming to know' (Johnson et al., 1975).

This paper proceeds by (i) describing the design strategy of Monetary Economics and the major features of the course; (ii) explaining the evaluation procedure; (iii) analyzing the results of a three stage evaluation carried in 1979 with the original group of students, a follow up evaluation with this group in 1980 and with the 1980 group of students; (iv) discussing some issues and consequences of the three stage evaluation.

2. The Design Strategy

The general features of the design strategy of Monetary Economics was that the course should be learner centred so that

- (a) learners should have the opportunity to make some decisions about course content and assessment; and
- (b) learners should achieve mastery of the basic elements of the course.

2.1 Theoretical Considerations

The design strategy incorporates principles derived from various pedagogical (and andragogical) theories. The theory of teaching outlines by Johnson et al. (1975) specifies responsibilities of the teacher which are met by the provisions of the course design. While Johnson et al. (1975) do make some reference to the quality of individual learning, the basic principle of mastery is derived from the work of Keller (1968) and of Sherman (1974).

In effect the design of the course corresponds to the two-tier concept developed by Imrie et al. (1980) from the work of Bloom (1956), Gronlund (1970) and others, in terms of a first tier of 'mastery' and a second tier of 'problem solving'. A corresponding two-tier structure of assessment, directly linked to course objectives and performance requirement, is described by Clift and Imrie (1980b).

The 'trigger' effect of assessment on learning is discussed by Elton and Laurillard (1979) and also discussed by Himmelweit (1967). Finally, the concept of andragogy (Knowles, 1970) or principles of adult learning, is certainly relevant to the learner-centred approach of this course for external, mature age students studying part-time.

2.2. Subject Consideration

The development of the course, Monetary Economics, was based on the conviction of one of the authors (Stanford) that the research procedures of the economist should be brought to bear on the design and development of such a course for advanced undergraduate students. Central to the problem of course design was the economist's view that the question was one of optimization of multiple interdependent goals in the face of limited resources and constraints of time.

The specific skills of the economist lie in the ability to construct an analytical model (of the economy or of some aspect of the economic process) which uses relatively simplified constructs to shed light on real world problems. Fundamental to that ability is the creative use of abstraction to clear away peripheral matter so that key issues are exposed to examination. Thus the skills of the economist have to be seen as being similar to that of an imaginative artist rather than as routine applications of standard methods and techniques.

This proposition has been most aptly put by John Maynard Keynes (1932):

The Theory of Economics does not furnish a body of settled conclusions immediately applicable to a policy. It is a method rather than a doctrine, an apparatus of the mind, a technique of thinking, which helps its possessor to draw correct conclusions.

Acquiring the skills of an economist requires students to be able to think through conclusions on policy issues in a systematic way (Fels, 1974) and to evaluate and use both qualitative and quantitative evidence when conflicting viewpoints and approaches are encountered (Saunders, 1975).

Monetary Economics is the branch of economics concerned with the study of financial (and especially monetary) behaviour and of their interaction with real behaviour. Real behaviour describes activities which are concerned with the production exchange and consumption of real goods and services while financial behaviour consists of such activities as lending and borrowing or buying and selling financial assets. Buying a new printing press constitutes real behaviour; buying shares in a newspaper company on a stock exchange is financial behaviour.

A successful study of Monetary Economics requires attainments of a high order and wide diversity; thus a student must understand:

- (a) some of the most fundamental concepts in economics,
- (b) the factual nature of the structure and operations of financial institutions and markets,
- (c) that the significance of Monetary Economics lies in the study of the effects of financial on real behaviour. Monetary Economics is not to be confused with courses such as "Business Finance", "financial Institutions" or "The Capital

Market" with which, to the lay person, there may appear to be some connection.

Monetary Economics is, on the one hand, a highly abstract and theoretical area of study; on the other hand, it is rather more concerned with actual institutions and practices than are some other branches of economics. The nature of Monetary Economics poses interesting questions about how to balance these various requirements. One does not want students of Monetary Economics to be concerned with theoretical puzzles to the exclusion of knowing about national and international capital markets. It is not appropriate, either, for the student of Monetary Economics to be concerned solely with institutional details which are more suitable to the training of the accountant or the stock broker.

The solution to this dilemma lies in the professional and academic judgments made by the course designer; judgments which are tempered by the profession's views. The judgments made by the profession about these matters do change over time. For instance, over the last twenty years, there have been several shifts of emphasis in the study of Monetary Economics and, as well, there exists two clearly articulated schools of thought, "Monetarists" and Keynesians".

2.3 Student Characteristics

Information about the initial enrolment of students available before the course materials were finalized indicated that 38 per cent of the students lived in Queensland, 42 per cent elsewhere in Australia and 10 per cent overseas. Two-thirds of the students had one or more degrees, 55 per cent of which were in disciplines other than Economics, Commerce

or Business. For age distribution, 42 per cent of the students were aged between 21 and 29, 42 per cent between 30 and 39, with 17 per cent aged 40 or over. More details of these characteristics are given by Stanford (1979) together with information on occupations.

The availability of such information was extremely significant in strengthening the preliminary design outline with reference to the following considerations:

- (1) the student population is widely dispersed and there are very few students in any one locality;
- (2) a large proportion of students live in, or in close proximity to, large metropolitan areas;
- (3) a small proportion of students live in remote areas;
- (4) the students have a considerable degree of experience and success in university studies;
- (5) the students are mature adults who hold responsible positions in business, government, teaching and the armed services.

The implications from these inferences are that:

- (a) these students not only can be, but should be, treated as responsible, successful adults;
- (b) the opportunities for students to gain access to research libraries near their residence vary from almost certain to impossible;
- (c) the motivation for students taking the course is likely to vary significantly;
- (d) the opportunity for extensive small group discussion by lecturer visits or by collecting students in Brisbane is very limited.

This information confirmed certain assumptions concerning basic principles of the course design, viz. that the course should provide opportunity for independent study and also make appropriate provision for individual differences of ability and experience among the members of the course.

2.4 Principles of Design

The general principles for the design of the course have a logical development:

- (1) the course is to be designed and developed as a system for learning;
- (2) the system should focus on the requirements of the learner;
- (3) the system should not only allow, but encourage, the student to become an independent learner;
- (4) the system should allow students to make some decisions about how they study in the course. It is not expected that all students in the course would undertake the same activities in the course; hence students should have the opportunity and be encouraged to make some decisions about
 - the pace at which they will learn;
 - what they will learn;
 - how they will learn;
 - how they will be assessed.
- (5) students should also learn how to determine whether they have learned what they are supposed to have learned and also what they wish to learn.

In order to meet the requirements of these design principles, students should be informed at the outset of the course, of:

- what it is expected that they will learn;
- how they may learn this;

- how they will know whether they have learned this.

Hartman (1978) has reported a high level of student dissatisfaction with intermediate courses in economics at Harvard University and has suggested that new methods of presenting information should be devised and that students should be allowed the opportunity for working on more independent assignments.

The general design strategy for the course is influenced by this and other evidence from research on economics education (e.g. Fels, 1974, and Saunders, 1975) which suggests that:

- (a) essential elements of knowledge or essential skills should be identified;
- (b) the mastery principle should apply in this area of the course;
- (c) other areas of the course should allow the exercise of essential skills and the use of essential knowledge in application to the solution of specific problems and the consideration of specific issues.

To develop such a strategy principles of (PSI) Personalised System of Instruction (Keller and Sherman, 1974) and of mastery learning (Block and Burns, 1975) should be used.

The use of PSI in economics has been examined by Spector (1976) and Allison (1976). Spector reports the results of an offering of Principles of Macroeconomics at the State University College of Buffalo by the Keller Plan and discusses the experience of five other colleges with a PSI approach to economics. Spector concluded that "students seem to do better than or as well as non-PSI students, and they seem to like this method of instruction".

The conclusions of a study (Allison, 1976) of Self Paced Instruction (SPI) in elementary economics at Harvard are that:

Nevertheless, at least within the Harvard context it appears that we can purchase a fairly substantial and lasting improvement in scores for roughly \$35 per student per semester. We seem to have allowed our students to substitute efficient, interactive hours for passive or unfocused hours although apparently not to their great pleasure.

Of particular interest is the development of a new teaching strategy for Monetary Economics (Bizard and Magin, 1972; Nevile et al., 1973) for third year undergraduate students at the University of New South Wales. The new approach was developed because of criticism that lectures emphasise passive learning by students, in the following forms:

- the 'conventional lecture situation' cannot provide for immediate and effective two-way feedback from student to lecturer;
- the lecture cannot be geared to the needs of individual students.

The aims of the new approach to Monetary Economics were to enable students to learn at their own individual pace and to increase the level of activity and involvement by students in the learning process. To achieve these aims, audio-tapes, workbooks and small group syndicate discussions were used.

2.5 The Course Structure

The course design:

- (a) divides the course into modules each of which consists of theoretical concepts, theoretical analysis or empirical generalisation relating to one facet of the course;

- (b) divides the course into two sections of CORE modules and ADVANCED modules respectively;
- (c) provides study guidance appropriate to the modules in each section. An overview of the course is considered to be of central importance for the course structure. It contains all relevant information about the course for students at the beginning of the course, so that
 - students can make a rational decision about whether to continue with the course or not;
 - students can continue to make decisions about the deployment of their time during the semester.

In addition to providing students with a comprehensive statement of the course design and content together with learning objectives and strategies, the overview of the course provided

- an explicit statement of the relationship of the various elements of the course to each other and to the objectives of the course;
- a detailed guide to reading the text books;
- a guide to further reading including the call numbers of reference books as indexed in the University of Queensland Library;
- a guide to the presentation of assignments;
- a complete statement of how the students are to be assessed.

In addition the overview represents the basis of an implicit contract between the students and the lecturer in terms of the commitment of the lecturer to the conduct of the course and to assisting students with difficulties.

2.5.1 Course Objectives

Students are provided with a Statement of the Objectives of the course which reads as follows:

General Objectives: to ensure that you can examine theoretical and policy issues in modern monetary economics with the standard analytical techniques of the discipline.

CORE Modules

- A. You should be familiar with the standard concepts, terms and ideas of the Monetary Economics (referred to in the course as "the Language of Monetary Economics").
- B. You should be able to use the Language of Monetary Economics accurately and appropriately.
- C. You should be familiar with the standard doctrines and propositions of Monetary Economics.
- D. You should be able to use these propositions analytically i.e. carry out "Exercises in Economics Analysis".
- E. You should be familiar with the general details of monetary institutions (for both domestic and international economy) and with broad empirical trends and generalisations.

ADVANCED Modules

- F. You should be able to combine "the Language of Monetary Economics", institutional detail and empirical generalizations and standard economic doctrines, with the analysis of theoretical and empirical issues.
- G. You should be able, in analyzing theoretical and policy issues, to distinguish between:

- (1) economic and non-economic issues;
 - (2) questions of fact (or analysis) and questions of values;
 - (3) different theoretical concepts of problems and processes.
- H. You should be able to state, in analyzing theoretical and policy issues:
- (1) what the problem or issue is;
 - (2) how and to what extent the analysis is limited;
 - (3) which theories are relevant to the analysis;
 - (4) which economic facts are relevant to determine the questions of fact;
 - (5) whether these facts can be readily obtained.

2.5.2 The CORE Section

The CORE section specifies the fundamental concepts of Monetary Economics which are of central importance and which form the foundation for further study in the area. For CORE modules the objectives are defined in operational forms. The notion of a 'pass' (equal to 50 per cent of a knowledge sample) in these fundamental aspects of the course, is not acceptable and is replaced by the requirement of 100 per cent mastery of CORE modules. Each CORE module consists of:

- (1) a statement of the prerequisite knowledge required for study of the material in the module;
- (2) an introduction which sets the material in the CORE module into context;
- (3) a statement of the learning objectives to be attained by students after completing the module;
- (4) a set of instructions about how the learning objectives for the module can be attained;
- (5) a collection of course materials for the module;

- (6) a SELF ASSESSMENT test to determine whether the learning objectives for the module have been attained;
- (7) a GUIDE to ANSWERS for the SELF ASSESSMENT tests;
- (8) a set of instructions about what students should do if they do not attain the learning objectives for the module;
- (9) a set of instructions about what students should do when they attain the learning objectives of the module;
- (10) an audio-cassette which introduces the module.

2.5.3 The ADVANCED Section

For ADVANCED modules, the objectives are to enable students to apply the fundamental techniques of the CORE modules to analyse issues and to develop solutions to problems. The use of a standard analytical procedure (STAP) is designed to ensure that analysis clearly identifies differences in policy objectives, in values, in theoretical emphases, in facts and in interpretation and solution.

The course design allows students a large element of choice as to which ADVANCED modules they will study and also the extent to which they study each module subject to a general requirement for adequate breadth of study in each course.

2.5.4 Assessment Requirements

There are four forms of assessment in this course on Monetary Economics:

- (1) Self Assessment for the CORE modules. Each CORE module includes a self assessment test together with instructions for procedure.
- (2) FEEDBACK - multiple choice assignments are included in some of the core modules. These assessments are not compulsory

and are provided to give students the opportunity of further indication of their progress in the course.

- (3) Assignments for the ADVANCED modules.
- (4) Examination at the end of the semester - only if all (three) assignments for the ADVANCED modules have not been submitted. Students also have the option of sitting an examination in an attempt to improve their marks from the three assignments.

2.5.5 Audio-Cassettes

In addition to written material in the CORE modules, students were provided with an audio-cassette for each module; audio-cassettes were also provided for most of the thirteen ADVANCED modules. The cassettes intended to:

- (a) overcome the distance between teacher and student and create a 'one to one' relationship between teacher and student;
- (b) provide a supplementary learning stimulus for the student.

In order to achieve these effects, the cassettes did not attempt to convey additional information about the course material and were in no sense "lectures" (this was the last thing they were intended to be). The recorded talk explained why the particular approach of the module had been adopted and what was expected of the student in studying this module; it also described the relationship of the materials in the module to other modules and to other areas of economics. (For example, it was pointed out in the talk on CORE module ONE that the mean-variance approach to portfolio theory is directly analogous to the standard theory of consumer demand and that they are both specific examples of a more general analytical approach of constrained optimization.)

The technical quality of the recordings was not excellent (they were not recorded in a studio and were unedited). This was due, in part, to the facilities available for the recording and production of the cassettes but in another sense reflected a fundamental choice about the style of the recording. By the provision of audio-cassettes it was hoped to overcome the barrier of distance, both actual and psychological, between the student and the teacher and to generate a more personal atmosphere. It was felt that a cassette, recorded in an informal conversational tone, would convey something of the teacher's personality and would also convey the impression that over the barrier of distance and "on the other end of the log" sat a real person. Cassettes were also to have the advantage of being available for use in non-formal study situations such as when doing routine chores at home or driving a car.

Audio-cassettes are widely used with external students for a variety of purposes. For example the Open University Foundation course on Technology used audio-cassettes for home experiments as well as in the way described above. In a study conducted at the University of New England into the use of audio-cassettes by external university students (Crew, 1979) it was reported that:

- (a) 73 per cent considered that cassettes made their course easier;
- (b) 92 per cent preferred having cassettes as part of the course.

Almost all students think cassettes have a great academic value, as well as a real personal value in giving stimulus and overcoming isolation.

In a study based on an economics course (Intermediate Price Theory) at California State University, Northridge, Tabachnick et al. (1978) evaluated the experiences of 72 students randomly assigned to one of four

learning conditions: (1) videotape plus worksheet, (2) audiotape plus worksheet, (3) combination of audio- and videotape plus worksheet, and (4) worksheet only. The study did not test retention and considered tapes only as supplements to the written material (as in the case of Monetary Economics). The following findings are of interest (Tabachnick et al., 1978).

If positive student attitude is considered to be a significant aspect of the learning experience, then some form of tape in combination with worksheets, is to be preferred over worksheets by themselves (p. 320).

Despite student preference for videotape, it was concluded on the basis of ratings of helpfulness that audiotapes provided the most cost-effective alternative (p. 319).

Videotapes can enhance student awareness of the teacher as a person and, of course, can complement the audio- and written word channels with images. However the videotape should be used sparingly for its unique advantages of showing the real world and portraying personalities.

Another role of the audio-cassette, reported by Logan et al. (1976), is that of providing student feedback on student performance in practical examinations and with project work. The study indicated that:

- (1) student performance was improved;
- (2) students preferred audiotape cassette feedback to traditional modes;
- (3) students tended to believe that feedback comments were more complete than the usual written comments.

3. Evaluation Procedures

The evaluation is intentional (Clift and Imrie, 1980a), the intention being to identify strengths and weaknesses so that improvements can be made if required. The lecturer's intention in initiating such an evaluation is to test the effectiveness of the course design and to learn from the experience. It may also be noted that it should be a professional responsibility to evaluate any innovation or change with reference to intended outcomes.

3.1 The First Stage of the Evaluation

The first stage of the evaluation was an overall description of student experiences of the first year of the course. This was based on formal assessment and on student response to an end of course questionnaire designed for both scale format and free comment responses.

The questionnaire was designed in conjunction with the lecturer (Stanford) and was sent to students after their final examination but before students received their grade for the course. With many end of course evaluations questionnaires are distributed before the final examination which is likely to have an important influence on student attitude and learning.

3.1.2 Use of Audio-Cassettes in Evaluation

The questionnaire was designed to take the student systematically through the experiences of the course so that student response to a particular question could be made in the context of related considerations. To explain this intention, an audio-cassette message was sent to each student with the questionnaire. The audio-cassette provided an opportunity for the evaluator (Imrie) to introduce himself and then to discuss

principles and details of the evaluation with reference to the questionnaire. Accompanying the audio-cassette were the following requests:

PLEASE: LISTEN TO THE CASSETTE BEFORE STARTING THE QUESTIONNAIRE.
ADD ANY ADDITIONAL COMMENTS TO THE OTHER SIDE OF THE CASSETTE.
RETURN THE CASSETTE WITH YOUR COMPLETED QUESTIONNAIRE.

Three students took the opportunity of adding additional comments.

Since student participation in the appraisal of teaching is of great significance (Clift and Imrie, 1980b) the results of the first stage evaluation were of the students of the Monetary Economics 1979 course, asking them in particular to comment on the evaluation results and, in general, to offer further comment some six months after completing the course.

3.2 The Efficiency and Cost Effectiveness of the Course

Since XC301 Monetary Economics differs from most conventional courses in design and in implementation, it is clearly of prime importance to determine whether the new design is efficient and cost effective. Thus part of the evaluation should be concerned with these issues.

The concept of efficiency deals with the relationship of inputs and outputs and is especially concerned with the issue of whether students are able to achieve the learning objectives with minimum effort. (Alternatively we could say that efficiency exists if students are able to learn more for a given effort.) This concept of efficiency focusses on the use and application of student time and student effort. It is taken as given that student time is a scarce resource and that there are alternative uses of student time. Since all students in the course were part time and were heavily committed in their private and family life, it would be expected

that the alternative use element or opportunity cost of their time was high but, of course, different for each student.

The design of the course placed emphasis on the improvement of the relative efficiency of the course; it incorporated a number of self-pacing features and allowed student choice in a number of areas so that students were offered the opportunity to work in an efficient manner. However an efficient course, in this sense, can be purchased by a course design which uses expensive resources such as academic staff time. The second aspect of the evaluation is whether an efficient course is also cost effective.

Evaluation of the cost effectiveness of a course requires the establishment of the appropriate criteria for the optimal use of resources in a course. What we are concerned with is the achievement of the greatest effect per dollar spent; not the minimisation of the number of dollars spent. Cost effectiveness also required that scarce resources are used where their contribution is greatest. For example it is not appropriate to use academic time to carry out functions which are relatively unskilled or which can be performed adequately by non-academic personnel.

To summarise, it is important to determine the efficiency with which it is necessary to see learning objectives are attained but in addition that any given level of efficiency is achieved with maximum effectiveness. Any particular study of efficiency and cost effectiveness is bedevilled by a number of problems the most important of which are:

- (1) measuring inputs and outputs in the teaching/learning process
- (2) identifying the relationship between specific inputs and outputs
- (3) allocating costs to a particular function.

3.2.1 Inputs, Outputs and Cost

The measurement of inputs and outputs is especially difficult for two reasons:

- (a) it is not always clear, conceptually, what we should be measuring, and
- (b) even if we can decide on conceptual meanings it is still difficult to obtain actual measurements.

Siegfried and Fels (1979) argue that there are five dimensions of output: (i) cognitive performance, (ii) student attitudes towards the subject and the educational process, (iii) the impact of understanding and attitudes on subsequent behaviour, (iv) changes in values and (v) distribution of benefits between students. They recognise however that nearly all studies of economics education have "measured output in three principal ways: (i) examinations, (ii) student evaluation questionnaires, and (iii) a kind of market test using numbers of majors attracted or enrolments".

In the evaluation of Monetary Economics, output is, in effect measured by student performance in terms of course assessment requirements and by student evaluation based on student perceptions of the experience of the course with reference to the process of developing independence in learning as well as the product - coverage of material.

University accounting systems do not provide a relevant allocation of costs to academic functions. (What they do is to record expenditure under certain categories and within certain structures.) University accounting systems do not routinely allot costs to particular courses; to ask "What did Monetary Economics cost to implement in 1979?" is to pose a question which cannot be readily answered.

3.3 The Second Stage of the Evaluation

The second stage of the evaluation used a questionnaire which was again designed for both scale format and free comment responses. It must be noted that students had received a formal grade for the course. (The first stage evaluation was completed before students were officially notified of their results although those who choose the assignment method of assessment had substantial information about the possible grade. The second stage evaluation sought to compare student responses to the course at this juncture with their initial responses.)

3.4 The Third Stage of the Evaluation

The third stage of the evaluation was designed in a similar way to the first stage but additionally and specifically sought information on changes in the course structure in relation to areas which the first stage evaluation suggested would need modification.

In order to make an extensive and valid comparison between the first and third stages of the evaluation, the questionnaire used in the third stage was structured in a similar manner to that used in the first stage.

A similar procedure to the first stage was carried out in the third stage of the evaluation. Students received by mail the questionnaire, an introductory letter to explain the purposes of the evaluation prepared by the course presenter in conjunction with the evaluator, an audio-cassette spoken by the evaluator which assured students of the confidentiality of their replies and an invitation to record comments on the blank sides of the cassette together with a reply paid envelope for return of the questionnaire and cassettes.

4.1 The Evaluation Response

The extent and nature of student response to each stage of the evaluation is summarized below:

Table 1: Response to the Three Stages of the Evaluation

	1st Stage	2nd Stage	3rd Stage
Total number of students completing the course	25	-	19
Completed Questionnaire Received	23	-	18
Response Rate %	93	-	95
Follow up Questionnaire sent in 2nd Stage	-	23	-
Completed Follow up Questionnaire Received	-	15	-
Response Rate %	-	65	-
Number of Students Recording Comments on Cassette	3	-	2

The high response rates to the first and third stages of the evaluation can be attributed in part to the efforts of the evaluators to encourage students to respond. Students who had not responded to the questionnaire after approximately two weeks were contacted by telephone or telegram and requested to respond.

The lower response to the second stage of the evaluation is interpreted to be a result of a number of factors which include

- (a) the fact that off campus students are relatively mobile and

some had changed address.

- (b) the lack of any contact with those who didn't respond to the first invitation to complete the questionnaire.
- (c) the general satisfaction of students with the 1979 version of Monetary Economics which leads us to suggest there was no strong motivation to complete the questionnaire.

4.2 The Results of the Evaluations

The first measurement of the evaluation to be considered is the performance of students. The University of Queensland uses a seven point grading scale with guidelines as shown in Table 2 below:

Table 2: Grading Scale and Guidelines, University of Queensland

Grade	Approximate Percentage	Academic Standard
7	85-100	Outstanding Performance
6	75-84	Very good performance
5	65-74	Above average performance
4	50-64	Satisfactory average pass
3	Just below 50	Slightly below average
2	-	Well below pass level
1	-	Bad failure

4.3 Results of Course Assessment

The formal results of students taking Monetary Economics and who completed the course are given on the following page.

The results indicate that students have been able to satisfy the course assessment requirement at high levels.

Table 3: Formal Grade Obtained by Students in
Monetary Economics, 1979 and 1980

Grade	1979		1980	
	No. %		No. %	
7	9	38	3	16
6	3	13	11	58
5	6	25	3	16
4	5	21	2	11
3	-	-	-	-
2	1	4	-	-
1	-	-	-	-
	24		19	

From the results of student questionnaires, in Appendix A, we note that:

- (i) from question (h) students were satisfied with the assessment requirements for the course.

	%	
	1979	1980
satisfied	36	36
very satisfied	41	74
MEAN	4.13	4.67

- (ii) from question (n) the difficult level was about right;

(52% in 1979; 61% in 1980; mean - 1979 = 2.91; mean - 1980 = 3.28).

- (iii) from question (o), students found the course interesting;
student responses are

	1979	1980
interesting	39%	33%
very interesting	48%	61%
MEAN	4.34	4.56

- (iv) from question (p) students gave a high rating to the overall design of the course.

	<u>1979</u>	<u>1980</u>
good	50%	28%
very good	41%	72%
MEAN	4.34	4.72

From this evidence we judge that the work involved in Monetary Economics was a positive educational experience for most of the students in both years.

4.4 The Efficiency of the Course

Combining our judgement about the satisfactory educational experience with that about the formal grades achieved in the course, we infer that, in general, students were able to achieve at a high level in a manner which was acceptable to them.

This leads us to conclude that the course design is efficient provided the workload of the course was, on average, no higher than alternative courses.

The guidelines for a 10 credit point course at the University of Queensland provide that, on average, such a course requires 10 hours of student effort per week to a 13 week semester.

Monetary Economics was designed so that the CORE modules would require no more than 25 per cent of total time devoted to the course by an adequately prepared student.

Reference to the data response to question (1), as reported in Appendix A, suggests that the average time spent on studying CORE modules was of the order of 35 hours (although there was a substantial range of experience) which is consistent with the a priori expectation embodied in the course design and structure. We are lead to argue that this type of course design makes possible a more satisfactory and efficient learning

experience. This course, Monetary Economics, enables students to learn more with less effort by providing

- (i) a clear statement of attainable objectives
- (ii) effective guidelines for the attainment of these objectives
- (iii) ready access to a professional selection of relevant materials for study
- (iv) choice of content and assessment requirements so that individual students may optimize their learning experiences.

4.5 The Cost Effectiveness of the Course

The earlier discussion of cost effectiveness expressed a number of reservations in relation to the difficulties of undertaking a cost effectiveness (or cost benefit) study of this course but there do remain a number of comments which can be made about the costs of this course:

- (a) The major cost of designing a new course of this type is the academic staff time involved. The cost of course materials may be regarded as trivial in comparison. The overall design, development and implementation of the course was carried out during a period of secondment of the course designer (Stanford) to a higher education unit. Not all of the time of the secondment of five months, can be correctly assigned to the course development because some part of the time involved the academic development of the course designer and some part a learning experience. Nevertheless, the time period does give the appropriate order of magnitude. (Note that the duration or length of time is significant, as well as the amount of time.)

- (b) Consequently, the "set up" or establishment costs of the course are high and are high in relation to the running costs of the course. The average cost per student of providing this course depends, to a significant extent, on the enrolment of the course in a given year and the frequency of offering the course. The marginal cost (incurred by enrolling one more student) is low in relation to average cost per student.
- (c) Whether the design of this course is relatively more cost effective than traditional courses (both for distance and on campus students) can be precisely determined in the absence of a detailed breakdown of costs and cannot be determined absolutely from only two years' experience. However there are some comments which are relevant and which can help in forming a judgement about this issue.

Consider the following general propositions:

- (1) The 'set up' or establishment costs of any course are high in relation to the running costs;
- (2) Fixed costs, due to the method of payment of university staff, dominate in any course so that
- (3) the marginal cost (per student) of any course is lower than the average cost while
- (4) the average cost depends almost directly but not completely on the number of students enrolled and also on the frequency of course offering.

Given these propositions, the cost effectiveness of a course of this design would be worse only if:

- (a) the 'set up' costs were higher than a traditional course and/or
- (b) the direct material costs of the course were greater and/or
- (c) the course was less efficient.

We have already inferred that the students found a course of this design more efficient and effective than other courses of a traditional design (e.g. lecture paced, no assessment option, ineffective learning guidance). Any difference in direct material costs is likely to be trivial and hence the weakest expectation will be that a course of this design is no less cost effective than traditional courses. However, since there is no reason to suppose that the set up costs of a course of this design are higher than that of a traditional course, we are led to the stronger expectation that a course of this design is more cost effective.

4.6 Consistency of Results

We compare the results of the second stage of the evaluation with those of the first stage to obtain an indication of whether student experience is consistent through time.

The second stage evaluation questionnaire asked for comment on the difficulty of the course, the interest of the course and on whether the students were satisfied with their experience in the course in 1979.

The results for student assessment of the difficulty of the course are shown in Table 4 below.

A perfectly consistent response to the two questionnaires, where students indicate identical assessments in each stage of the evaluation, is shown by entries appearing only in the diagonal of the table. Entries above and to the right of the diagonal indicate that student assessment

Table 4: Student Assessment of Difficulty of Course -
First and Second Stages of Evaluation

1st Stage: 1979	2nd Stage: 1980 Follow up	Not at all Difficult	Not Difficult	About Right	Difficult	Very Difficult	TOTAL
not at all difficult	1		1				1
not difficult	2		1	1			2
about right	3			10	2		12
difficult	4						
very difficult	5						
TOTAL			2	11	2		15

Table 5: Student Assessment of Interest of Course -
First and Second Stages of Evaluation

1st Stage: 1979	2nd Stage: 1980 Follow up	Not at all Interesting	Not Interesting	Reasonably Interesting	Interesting	Very Interesting	TOTAL
interesting							0
not at all not interesting							0
reasonably interesting	3			1	1		2
interesting	4			1	4		5
very interesting	5				2	6	8
TOTAL		0	0	2	7	6	15

of the difficulty of the course have altered to consider the course more difficult after completing the course. In general the results displayed in the table indicate student assessment in the first and second stages of the evaluation was consistent.

Results for student assessment of the interest of the course are shown in Table 5. Again we conclude that the student assessment of interest of the course in the first and second stages of the evaluation is consistent.

Student assessment of their satisfaction with the course in 1979 in the second stage of the evaluation is shown in Table 6.

Table 6: Student Assessment of satisfaction with the course in 1979 at the second stage of evaluation in 1980

	Number	%
not at all satisfied	0	0
not satisfied	1	7
reasonably satisfied	6	40
satisfied	4	27
very satisfied	5	33
TOTAL	15	

4.7 Some Issues and Consequences

4.7.1 Validating Changes to the Course Structure

In response to particular comments in the first stage evaluation some changes had been made in the second version of Monetary Economics which was implemented in 1980. The third stage evaluation questionnaire sought particular information about these changes. The major variant in the second version of Monetary Economics was the provision of more material on audio cassette. From question (k) in Appendix A it can be seen that

48% of students in the first stage evaluation would have preferred more audio cassette material to supplement the printed material while 13% would have preferred more audio cassette material as a substitute for printed material.

The third stage evaluation showed that students were able to discriminate their preferences clearly for audio cassette material. There was a substantial expression of opinion in favour of the type of cassette in (b); type (a) was least preferred. Some indication of the distribution of preferences is given by Table 7 below:

Table 7: Number of Students Ranking Each Type of Cassette as First or Third Preference

	Type (a)	Type (b)	Type (c)
1st Preference	1	7	1
2nd Preference	5	0	3

Comments which illustrate further these preferences are:

In favour of type (b): "Can concentrate better when reading and listening"

In favour of type (c): "while less professional, served purpose well and like relaxed style"

In criticism of type (a): "entertainment rather than learning"
"cultured voice and production detracted from content"
"lacked understanding of subject" (mentioned by three students).

The general response to question (k) in Appendix A indicated a more acceptable balance of audio cassette material and written material had been achieved in the second version of Monetary Economics.

4.7.2 Procrastination

Procrastination is a general term used to describe student behaviour when assignments are late and when preparation is hasty due to 'being left to the last minute'. With a semester system and with increase in the use of in-course assessment, procrastination may in fact be work stress (Clift and Imrie, 1980b) attributable to the conflicting requirements of different courses, insufficient time for reading and literature retrieval and confusion due to poorly specified assignment instructions.

In the 1979 version of Monetary Economics the only deadline for the submission of assignments was the last day of the teaching semester. The experience was that most assignments arrived in a bunch on or around this date.

Consequently the 1980 version of Monetary Economics provided three deadlines approximately equally spaced throughout the semester. The variation resulted in a change in the nature of the problem as assignments tended to bunch around each of the three deadlines.

We incline to the explanation, that although the course design allows independence in arranging an individual work programme, the conditioning of previous educational experience had lead many students to maintain dependence on officially determined deadlines. Some indication of this reliance on the institution is given by student comment:

"Inclined to devote less time because of final exam. Tended to overlook personal objectives. Maybe compulsory FEEDBACK assignments would help." (1980)

"To help mastery of areas in which one does not do assignments, could we have FEEDBACK assignments on those?" (1980)

4.7.3 Covering the Syllabus

It was evident that some students felt concerned that they were not required to study all of the modules. One student (1979) commented that "19 individual 'topics' is too many for a course of this length".

These students have missed two basic principles of the course design:

- (1) the ADVANCED module section explicitly allowed for student choice of areas of study i.e. selection of an individual syllabus - different according to the needs and interests of each student;
- (2) learning should not be dependent on assessment requirements; students who felt that more assignments would have helped them cover more of the course are indicating their dependence on an extrinsic goal, i.e. completing the course or obtaining 10 credit points; in addition to the modules studied for the submitted assignments, the other modules are still available for casual reading, reference or further study - again an individual decision.

It is worth quoting for emphasis from the course material:

"The fundamental concept of the course design is that the ultimate responsibility for achieving learning goals lies with you. You know your own capabilities, your limitations, the constraints your ordinary life imposes on you and your own personal ambitions in this course."

5. Improvements in Evaluation Procedure

The three stage evaluation reported here is important not only in coming to some judgement about the effectiveness of the course being

evaluated and in suggesting improvements to the course but in suggesting improvements to the evaluation procedure itself.

The outline of the three stage evaluation indicates that there are three areas where the evaluation procedure might be improved and extended.

In the first place it would be useful to have some accurate measurement of the workload of the course. The evaluation procedures for 1981 are being modified to attempt to provide this information.

Secondly we would like to have an independent evaluation of the course content of Monetary Economics. Although the informal response to the content by those academic economists who have seen the course material has been favourable, it continues to be difficult to find someone who can spare the time to undertake a complete content evaluation.

Thirdly it would be useful to evaluate directly the operations of the course assessment requirements by having all student assessment work independently marked by a second academic. Again it has proved impossible to find a qualified academic who can devote time to this demanding activity.

6. Concluding Comments

The importance of evaluation in teaching is regarded as being self evident. Evaluation is an indispensable professional responsibility particularly where innovative changes are initiated.

Evaluation of a course is fundamental to educational technology and can involve the participation of students and colleagues in ways which have been described or indicated in this paper.

With Monetary Economics, as with other courses which teach at a distance, students are guaranteed 'a good set of notes'. The teacher not

only prepares the material in advance but prepares it knowing that it will be available for peer appraisal; the teaching of content is no longer a private function of the classroom.

Although Monetary Economics does not involve regularly scheduled class contact, the personal and personalized link between student and teacher has been provided by other means particularly through the use of audio cassettes. As a further example of technology in education, the audio cassette has been used to involve students in evaluation of the course.

The two-tier structure of CORE and ADVANCED modules, and of assessment as an important learning influence are based on well established learning principles. Not only is the two tier more effective for study development but it also distinguishes between mastery learning for general recall-application (which is content dependent) and the particular higher order skills of problem solving which are potentially independent of content.

Monetary Economics has been designed to a positive contribution to distance education; it is not an attempt to overcome the supposed difficulties of this mode of study. The design of Monetary Economics provides a consistent and coherent approach to distance education which takes advantage of freedom of being a distance student; a freedom which enables study to take place independently.

The evidence from the third stage evaluation of Monetary Economics has lead to the conclusion that this course is both efficient and cost effective and that it is relatively more efficient and effective than traditional courses. Moreover it is highly likely that the principles of the design and structure of Monetary Economics can be transferred to on campus courses with advantages to students.

In essence, the effectiveness of Monetary Economics is directly attributable to the effectiveness of education technology which employed sound principles of learning to solve a problem in course design.

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Appendix A: Questionnaire Responses 1st Stage -
1979 and Third Stage - 1980

(More detailed reports on the responses, including selected student comments, are available on request from the authors.)

	n	=	1979 23	1980 18
(a) How many University of Queensland credit points do you have?			M = 199	190
(b) If you were enrolled in <u>second semester courses</u> other than <u>Monetary Economics</u> what is the total number of credit points for these <u>other</u> courses			M = 10.7	21.5
(c) How clear are the objectives of the course? (percentages are given as % of respondents to each question)			1979(%)	1980(%)
not at all clear			0	0
not clear			0	0
reasonably clear			13	17
clear			35	17
very clear			52	67
(d) Do you understand the objectives of the course?				
YES			96	100
NO			4	0
(e) How satisfied are you that you have achieved <u>your personal</u> objectives for this course?				
not at all satisfied			4	0
not satisfied			9	0
reasonably satisfied			39	39
satisfied			35	39
very satisfied			13	22
(f) How clear are the assessment requirements of the course?				
not at all clear			0	0
not clear			4	0
reasonably clear			13	0
clear			30	6
very clear			52	94
(g) Do you understand assessment requirements of the course?				
YES			100	100
NO			0	0

Appendix A (Continued)

	1979	1980
(h) How satisfied are you with the assessment requirements of the course?		
not at all satisfied	0	0
not satisfied	5	0
reasonably satisfied	18	0
satisfied	36	36
very satisfied	41	74
(i) How satisfied are you with the outcomes of your FEEDBACK assignments?		
not at all satisfied	0	0
not satisfied	0	0
reasonably satisfied	0	0
satisfied	37	60
very satisfied	63	40
(j) How satisfied are you with the outcomes of your essay assignments?		
not at all satisfied	0	0
not satisfied	0	0
reasonably satisfied	0	29
satisfied	44	53
very satisfied	56	18
(k) Please indicate whether there should be more or less audio-cassette material in the course		
(i) to <u>supplement</u> the printed material?		
- less	9	17
- current provision 'about right' for me	43	72
- more	48	11
(ii) as a substitute for printed material?		
- less	39	39
- current provision 'about right' for me	48	61
- more	13	0
(l) Please estimate (a) the least time, (b) the most time, that you spent completing a <u>CORE</u> module?		
(a) Least time for a CORE module: Range	30-240	2-120
(b) Most time for a CORE module: Range	60-270	3-480
(m) Did this course in <u>Monetary Economics</u> require more, or less, work than you expected for a level three, ten credit point course?		

Appendix A (Continued)

	<u>1979</u>	<u>1980</u>
(m) Did this course in <u>Monetary Economics</u> require more, or less, work than you expected for a level three, ten credit point course?		
a lot less	0	0
less	9	0
as expected	70	61
more	13	28
a lot more	9	11
(n) Please give your overall assessment for the course as a whole.		
Difficulty:		
not at all difficult	4	0
not difficult	22	6
about right	52	61
difficult	22	33
very difficult	0	0
(o) Interest:		
not at all interesting	0	0
not interesting	0	0
reasonably interesting	13	6
interesting	39	33
very interesting	48	61
(p) Design:		
very poor	0	0
poor	0	0
reasonable	9	0
good	50	28
very good	41	72